2025 Maine Cancer Snapshot
Special Topic Technical Supplement:
Assessing the Feasibility of Applying PAF Methods to Maine Risk Factor Associated Cancer Data

A TECHNICAL SUPPLEMENT BY THE MAINE CANCER REGISTRY

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2025 Maine Cancer Snapshot
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Acknowledgements

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Background:

Providing timely, local and actionable data to Maine public health stakeholders is a continuing goal of the Maine Cancer Registry (MCR). Population attributable fractions (PAF) help identify which risk factors are most important to address in public health interventions to reduce disease burden. The PAF is the estimate of the proportion of disease in the total population that is caused by exposure to the risk factor, and so represents the proportion of disease that could be prevented if the exposure was eliminated. The PAF takes into account how common a risk factor, such as smoking, is in the population (prevalence) and how much this exposure or behavior increases the risk of a disease such as cancer (relative risk). Calculating PAFs for risk-associated cancers in Maine will increase our understanding of the burden of cancer in Maine and opportunities for prevention.

The recent publication of Islami et al. (2024) provides population attributable fractions (PAF) for a selection of modifiable risk-associated cancers for the U.S.[1] In the 2025 MCR Cancer Snapshot [2], published PAFs based on U.S. cancer case counts and exposure data were used to estimate the number and percentage of new cancer cases attributable to several different modifiable risk factors. Prior to using this simplified method, we explored the feasibility of using Maine case counts and Maine historic smoking status data to calculate the PAF of cigarette smoking specific to Maine. Our methods and results are described below.

Objectives:

- To calculate Maine-specific PAFs for cigarette smoking and cancer types based on nationally published relative risks, historic state-level Maine smoking prevalence, and Maine current cancer incidence data.
- To determine the number and proportion of Maine cancers attributable to cigarette smoking based on the application of Maine-specific PAFs and to assess whether Maine-specific findings are similar to recent national results.

Methods:

- Based on the methodology used by Islami et al. (2024), we calculated Maine-specific PAFs for cigarette smoking by cancer type. We used these PAFs to calculate the number of invasive cancer cases among adults ages 30 and older in 2017-2021 attributable to cigarette smoking.
- We obtained the prevalence of three levels of smoking status (current smoker, former smoker, never smoker) for Maine for 2008-2010, using the BRFSS Web Enabled Analysis Tool[3] (WEAT). We chose this time period because it allowed for an approximately 10-year lag period between exposure and cancer occurrence. Cancer incidence counts were obtained in SEER*Stat using the MCR 2023 dataset. We selected five years of cancer data (2017-2021) to increase our case counts and minimize groupings with zero cases. This time span was selected because it overlapped with the year of diagnosis of 2019 used in Islami's analysis.

1.Islami F, Marlow EC, Thomson B, McCullough ML, Rumgay H, Gapstur SM, Patel AV, Soerjomataram I, Jemal A. Proportion and number of cancer cases and deaths attributable to potentially modifiable risk factors in the United States, 2019. CA Cancer J Clin. 2024 Sep-Oct;74(5):405-432. doi: 10.3322/caac.21858. Epub 2024 Jul 11. PMID: 38990124.

2. 2025 Maine Cancer Snapshot, 2025. Maine Department of Health and Human Services, Maine Cancer Registry. August 2025.

3. Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Web Enabled Analysis Tool (WEAT). Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.

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Methods: (continued)

- We used the following approximate formula, in which *Pi* represents risk factor prevalence at the exposure category *i,* and *RRi* represent the corresponding relative risk (RR). RRs were obtained from Islami et al. (2024), Table S3, "Relative risks for the associations between evaluated risk factors and associated cancer types". The RRs are displayed in Table 1 and differ by cancer type and smoking status. When higher than 1.0, the RR identifies factors that increase the risk of developing a disease. The higher the RR, the stronger the impact of a risk factor. Lung, bronchus and trachea had the highest RR among current smokers compared to never smokers (23.86), whereas the RR for these cancers for former smokers compared to never smokers was 6.8.

$$PAF = \frac{\sum P_i(RR_i - 1)}{1 + \sum P_i(RR_i - 1)}$$

- For each sex and age group (5-year groupings for ages 30-84, then 85 and over), we calculated the PAF using 3 levels of smoking behavior. Maine incident cancer cases attributable to cigarette smoking by cancer type were calculated by multiplying the number of cancer cases by the PAF in each sex and age group, and adding the results across age groups, by sex.

Table 1: Relative Risks for the Associations Between Cigarette Smoking and Associated Cancer Types (from Islami 2024)

	Former vs. never-smoking	***Current vs. never-smoking***
Oral cavity	1.88	5.66
Pharynx	1.88	5.66
Esophagus	2.49	4.25
Stomach	1.30	1.81
Colorectum	1.20	1.51
Liver	1.38	2.10
Pancreas	1.08	1.74
Nasal cavity, paranasal sinus	1.88	5.66
Larynx	2.78	17.40
Trachea	6.80	23.86
Lung, bronchus	6.80	23.86
Cervix uteri	1.50	1.90
Ovary, mucinous only	1.16	1.79
Kidney, renal pelvis	1.38	1.55
Ureter	2.37	3.90
Urinary bladder	2.37	3.90
Acute myeloid leukemia	1.20	1.57

Methods: (continued)

- Overall PAFs for each cigarette smoking-associated cancer were calculated by adding the attributable cases in each age and sex stratum and dividing this total by the total case count.
- Similar to Islami, we limited our analysis to those aged 30 years and older. The authors justified this choice because cancer cases and deaths in younger ages accounted for 2.0% of all cancer cases and 0.6% of all cancer deaths in 2019, for many of which genetic predisposition to cancer might have been a strong contributing factor.
- Similar to Islami, cigarette-associated cancer types included in this analysis were based on evidence compiled by IARC Working Group 2012[1]. The following International Classification of Diseases, 10th revision codes were used: Oral cavity (C00–C08); pharynx (C09–C14); esophagus (C15); stomach (C16); colorectum (C18–C20, C26.0); liver (C22.0, C22.2-C22.4, C22.7, C22.9); pancreas (C25); nasal cavity, paranasal sinus (C30.0–C31); larynx (C32); trachea (C33); lung, bronchus (C34); cervix uteri (C53); ovary (C56) [mucinous type only]; kidney, renal pelvis (C64–C65), ureter (C66); urinary bladder (C67); acute myeloid leukemia (C92.0, C92.4–C92.6, C92.8, C94.0, C94.2).
- Islami obtained National Health Interview Surveys (NHIS) data for U.S. adult cigarette smoking status; as state level data is not available from the NHIS, we obtained Maine smoking data from the Behavioral Risk Factor Surveillance System (BRFSS).
- Estimates for risk-factor attributable cases for cancer sites with histological subgrouping, marked with an * (e.g. mucinous type only ovarian cancer) are calculated using the case count of the subgrouping divided into the count of all cancers in that site, not the proportion of cases in the histological subgroup.
- Islami's work applied a simulation method in their calculation methods and calculated confidence intervals. Due to the complexity of this method and available resources, these steps were not completed.
- We did not assess the attributable risk of second-hand smoke as state level data is not available for serum cotinine levels among Maine current and former smokers, which would be required to calculate state-level PAFs.

1. IARC Working Group. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100E: Personal Habits and Indoor Combustions. IARC Press; 2012.

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Results:

Risk factor prevalence is a major component of PAF calculations. As a first step, we assessed differences in smoking status by sex for Maine and U.S. As a further step we reviewed differences in U.S. estimates by data source. These differences in underlying risk factor prevalence estimates may contribute to observed differences in attributable cancer cases.

- The overall estimates for current smoking among adults in the U.S. in 2008-2010 was slightly higher in the NHIS than in the BRFSS for both males and females (23.5% vs. 19.9% among U.S. males and 18.6% vs. 15.8% among U.S. females). These differences are likely to reflect, at least in part, differences in the design of the surveys; NHIS is designed to provide accurate U.S. estimates, while BRFSS is designed to provide accurate state-level estimates.
- The overall BRFSS estimates for current smoking among Maine adults were similar to U.S. BRFSS estimates for both males and females (19.9% vs. 19.9% among males and 16.0% vs. 15.8% among females).
- Maine males and females had higher former smoking prevalence than in the U.S. For example, Maine males were more likely to be former smokers (33.1%) compared to U.S. males (NHIS: 27.1%, BRFSS 28.1%).
- Similarly, Maine females were more likely to be former smokers (28.8%) compared to U.S. females (NHIS: 20.4%, BRFSS 21.4%).
- Maine females were less like to have never smoked compared to U.S. females (55.1% vs. NHIS: 61.1%, BRFSS 62.8%).

Figure 1:

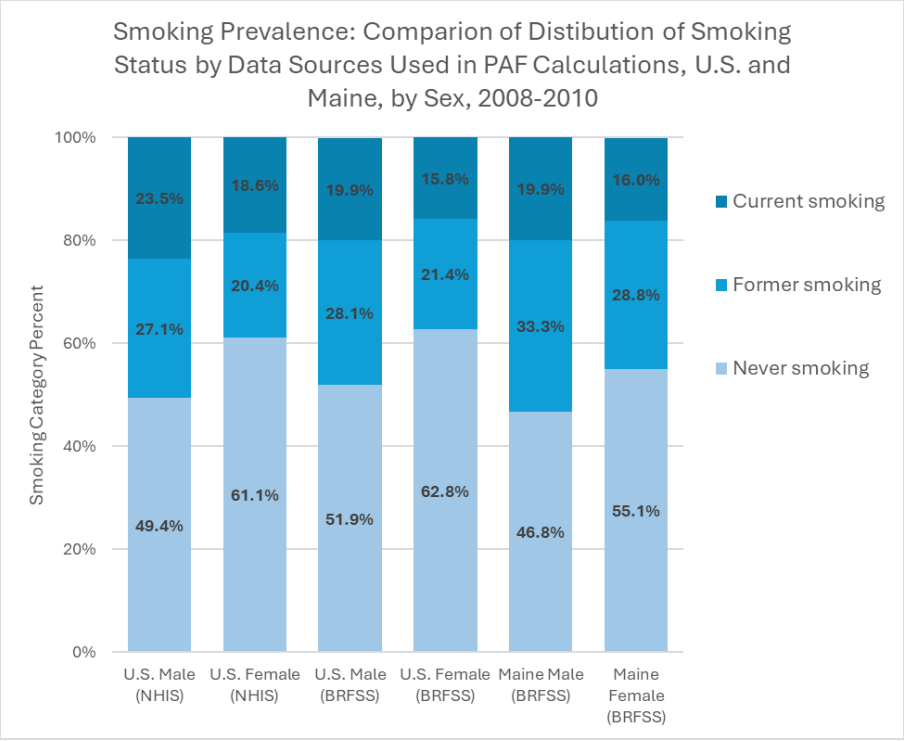

Table 2:

Smoking Prevalence: Comparison of Distribution of Smoking Status by Data Sources Used in PAF Calculations, U.S. and Maine, by Sex

	Data Source								
	NHIS (2008-2010)			BRFSS (2008-2010)					
	U.S.			U.S.			Maine		
Cigarette Smoking Exposure Categories	Male	Female	Total	Male	Female	Total	Male	Female	Total
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Never smoking	**49.4%** (48.7-50.1)	**61.1%** (60.4-61.8)	NA*	**51.9%** (51.6 - 52.2)	**62.8%** (62.6 - 63.0)	**57.5%** (57.3 - 57.7)	**46.8%** (45.4 - 48.1)	**55.1%** (54.1 - 56.2)	**51.1%** (50.2 - 52.0)
Former smoking	**27.1%** (26.4-27.7)	**20.4%** (19.9-20.9)	NA*	**28.1%** (27.9 - 28.4)	**21.4%** (21.2 - 21.5)	**24.7%** (24.5 - 24.8)	**33.3%** (32.1 - 34.5)	**28.8%** (27.9 - 29.7)	**31.0%** (30.3 - 31.7)
Current smoking	**23.5%** (22.9-24.2)	**18.6%** (18.0-19.1)	NA*	**19.9%** (19.7 - 20.2)	**15.8%** (15.7 - 16.0)	**17.8%** (17.7 - 18.0)	**19.9%** (18.7 - 21.1)	**16.0%** (15.2 - 16.9)	**17.9%** (17.2 - 18.6)

Notes:
NA* - NHIS U.S. Total - prevalence for combined three years (2008-2010) not available.

CI= 95% Confidence Interval

Data Sources:

NHIS data retrieved from Islami et al. (2024), Table S2. Distribution of exposures included in analysis by sex. Supplementary Material: caac21858-sup-0001-suppl-data.docx

BRFSS data retrieved from BRFSS Web Enabled Analysis Tool (WEAT)

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Results for Maine Adults (all sexes combined):

- Using Maine-specific PAFs resulted in fewer attributable case counts for most cigarette smoking-associated cancer types than applying U.S. PAFs to Maine case counts.
- Lower attributable case counts using Maine PAFs were likely due to using the Maine-specific current smoking prevalence estimates, which were lower than the U.S. estimates.
- The largest percent differences in attributable cancer case counts using U.S. PAFs instead of Maine PAFs were observed in cancer of the ovary (53.8%), pancreas (30.7%), acute myeloid leukemia (23.6%), and liver (14.6%).
- The overall percent of cigarette smoking-attributable cancers of all malignant cases among Maine adults was 20.9% using Maine-specific PAFs versus 22.3% using U.S. PAFs. Overall, using U.S. PAFs resulted in a slight overestimation of cancer incidence attributable to cigarette smoking.

Table 3: Difference in Estimated Cancer Cases in Maine Adults 30 Years and Older Attributable to Cigarette Smoking, 2017-2021: Comparison of Maine Specific PAF Calculations vs. Using National Published PAF

	PAF - Maine Calculation	PAF - U.S., Islami (2024)	Total 5 Year Case Count	Attributable Count Using Maine PAF	Attributable Count Applying U.S. PAF to Maine Data	Difference in Attributable Count: Applying U.S. PAF vs. Maine PAF	Percent Difference in Attributable Counts
Cigarette Smoking-Associated Cancer							
Lung, Bronchus	0.826	0.856	7,200	5.943.8	6,163.2	219.4	3.6%
Trachea	0.847	0.856	5	4.2	4.3	0.0	1.0%
Larynx	0.720	0.801	343	246.9	274.7	27.8	10.1%
Pharynx	0.489	0.568	520	254.1	295.4	41.3	14.0%
Oral Cavity	0.469	0.548	914	428.9	500.9	72.0	14.4%
Nasal Cavity, Paranasal Sinus	0.481	0.542	63	30.3	34.1	3.9	11.3%
Esophagus	0.501	0.539	721	361.2	388.6	27.4	7.1%
Urinary Bladder	0.469	0.507	2,789	1.307.6	1,414.0	106.5	7.5%
Ureter	0.465	0.492	78	36.3	38.4	2.1	5.5%
Liver	0.223	0.261	569	126.8	148.5	21.7	14.6%
Cervix uteri	0.209	0.216	221	46.1	47.7	1.6	3.4%
Stomach	0.179	0.204	587	104.9	119.7	14.8	12.4%
Kidney, Renal Pelvis	0.187	0.186	1,697	317.3	315.6	-1.6	-0.5%
Acute Myeloid Leukemia	0.128	0.167	423	53.9	70.6	16.7	23.6%
Pancreas	0.096	0.139	1,428	137.5	198.5	60.9	30.7%
Colon and Rectum	0.124	0.137	3,316	411.1	454.3	43.2	9.5%
Ovary*	0.004	0.008	379	1.4	3.0	1.6	53.8%
Cigarette Smoking-Attributable Cancers				9,812.3	10,471.7	659.4	6.3%
All Malignant Cancer Sites				46,916	46,916		
Percentage of All Malignant Cancers that are Attributable to Cigarette Smoking				**20.9%**	**22.3%**		

*Maine attributable count for ovarian cancer was calculated using case counts of mucinous type only; PAF computed by dividing total ovarian case count by calculated attributable case count of mucinous ovarian cancer.

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Results for Maine males:

- Among Maine males, using Maine-specific PAFs resulted in fewer attributable cases counts for every type of cancer associated with cigarette smoking than applying U.S. PAFs to Maine case counts. The largest percent differences in attributable cancer case counts using U.S. PAFs instead of Maine PAFs were observed in Acute Myeloid Leukemia (24.2%), Oral Cavity (14.1%), and Pharynx (12.3%).
- Overall, Maine-specific PAFs resulted in nearly 320 fewer attributable cases than applying national PAFs.
- Lower attributable case counts using Maine PAFs were likely due to using the Maine-specific current smoking prevalence estimates for Maine males which were lower than the U.S. estimates. The overall percent of malignant cancer cases attributable to cigarette smoking among Maine males was 24.7% using Maine-specific PAFs versus 26.0% using U.S. PAFs.

Table 4: Difference in Estimated Cancer Cases in Maine Males 30 Years and Older Attributable to Cigarette Smoking, 2017-2021: Comparison of Maine Specific PAF Calculations vs. Using National Published PAF

	PAF - Maine Calculation	PAF - U.S., Islami (2024)	Total 5 Year Case Count	Attributable Count Using Maine PAF	Attributable Count Applying U.S. PAF to Maine Data	Difference in Attributable Count: Applying U.S. PAF vs. Maine PAF	Percent Difference in Attributable Counts
Cigarette Smoking-Associated Cancer							
Lung, Bronchus	0.841	0.87	3,594	3,021.3	3,134.0	112.7	3.6%
Trachea	0.857	0.89	3	2.6	2.7	0.1	3.3%
Larynx	0.730	0.81	266	194.3	214.7	20.4	9.5%
Pharynx	0.509	0.58	412	209.6	239.0	29.3	12.3%
Oral Cavity	0.490	0.57	607	297.6	346.6	49.0	14.1%
Nasal Cavity, Paranasal Sinus	0.503	0.57	37	18.6	21.0	2.4	11.5%
Esophagus	0.532	0.56	584	310.5	324.1	13.7	4.2%
Urinary bladder	0.504	0.53	2,136	1,076.8	1,123.5	46.8	4.2%
Ureter	0.503	0.52	49	24.7	25.7	1.0	4.0%
Liver	0.274	0.27	433	118.8	118.6	-0.2	-0.1%
Stomach	0.196	0.22	374	73.4	82.7	9.2	11.2%
Kidney, renal pelvis	0.205	0.20	1,122	230.4	224.4	-6.0	-2.7%
Acute Myeloid Leukemia	0.140	0.19	259	36.3	47.9	11.6	24.2%
Pancreas	0.103	0.16	768	113.3	119.0	5.7	4.8%
Colon and Rectum	0.138	0.15	1,698	234.0	258.1	24.1	9.3%
Cigarette Smoking-Attributable Cancers				5,962.1	6,281.9	319.8	5.1%
All Malignant Cancer Sites				24,137	24,137		
Percentage of All Malignant Cancers that are Attributable to Cigarette Smoking				**24.70%**	**26.03%**		

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Results for Maine females:

- Among Maine females, using Maine-specific PAFs resulted in fewer attributable cases counts for every cigarette smoking associated cancer than applying U.S. PAFs to Maine female case counts.
- Overall, Maine-specific PAFs resulted in 302 fewer attributable cases than applying national PAFs. The overall percent of cigarette smoking-attributable cancers of all malignant cases among Maine adult females was 17.1% using Maine specific data versus 18.4% using national PAFs.
- Lower attributable case counts using Maine PAFs were likely due to using Maine-specific current smoking prevalence estimates for Maine females, which were lower than U.S. estimates.
- The largest percent differences in attributable cancer case counts using U.S. PAFs instead of Maine PAFs were observed in Ovary (53.8%), Pancreas (32.5%), Acute Myeloid Leukemia (23.9%), and Oral Cavity (19.9%).

Table 5: Difference in Estimated Cancer Cases in Maine Females 30 Years and Older Attributable to Cigarette Smoking, 2017-2021: Comparison of Maine Specific PAF Calculations vs. Using National Published PAF

	PAF - Maine Calculation	PAF - U.S., Islami (2024)	Total 5 Year Case Count	Attributable Count Using Maine PAF	Attributable Count Applying U.S. PAF to Maine Data	Difference in Attributable Count: Applying U.S. PAF vs. Maine PAF	Percent Difference in 2 Counts
Cigarette Smoking-Associated Cancer							
Lung, Bronchus	0.794	0.839	3,606	2,864.3	3,025.4	161.1	5.3%
Trachea	0.764	0.849	2	1.5	1.7	0.2	10.0%
Larynx	0.639	0.778	77	49.2	59.9	10.7	17.9%
Pharynx	0.450	0.520	108	48.6	56.2	7.6	13.5%
Oral Cavity	0.403	0.503	307	123.8	154.4	30.7	19.9%
Nasal Cavity, Paranasal Sinus	0.415	0.502	26	10.8	13.1	2.3	17.3%
Esophagus	0.449	0.482	137	61.5	66.0	4.5	6.8%
Urinary Bladder	0.423	0.448	653	276.4	292.5	16.1	5.5%
Ureter	0.429	0.441	29	12.5	12.8	0.3	2.6%
Liver	0.187	0.221	136	25.4	30.1	4.6	15.3%
Cervix Uteri	0.209	0.216	221	46.1	47.7	1.6	3.4%
Stomach	0.156	0.177	213	33.1	37.7	4.6	12.1%
Kidney, Renal Pelvis	0.161	0.162	575	92.8	93.2	0.3	0.3%
Acute Myeloid Leukemia	0.110	0.145	164	18.1	23.8	5.7	23.9%
Pancreas	0.082	0.121	660	53.9	79.9	25.9	32.5%
Colon and Rectum	0.105	0.120	1,618	169.7	194.2	24.4	12.6%
Ovary*	0.004	0.008	379	1.4	3.0	1.6	53.8%
Cigarette Smoking-Attributable Cancers				3,889.2	4,191.5	302.3	7.2%
All Malignant Cancer Sites				22,779	22,779		
Percentage of All Malignant Cancers that are Attributable to Cigarette Smoking				**17.07%**	**18.40%**		

*Maine attributable count for ovarian cancer was calculated using case counts of mucinous type only; PAF computed by dividing total ovarian case count by calculated attributable case count of mucinous ovarian cancer.

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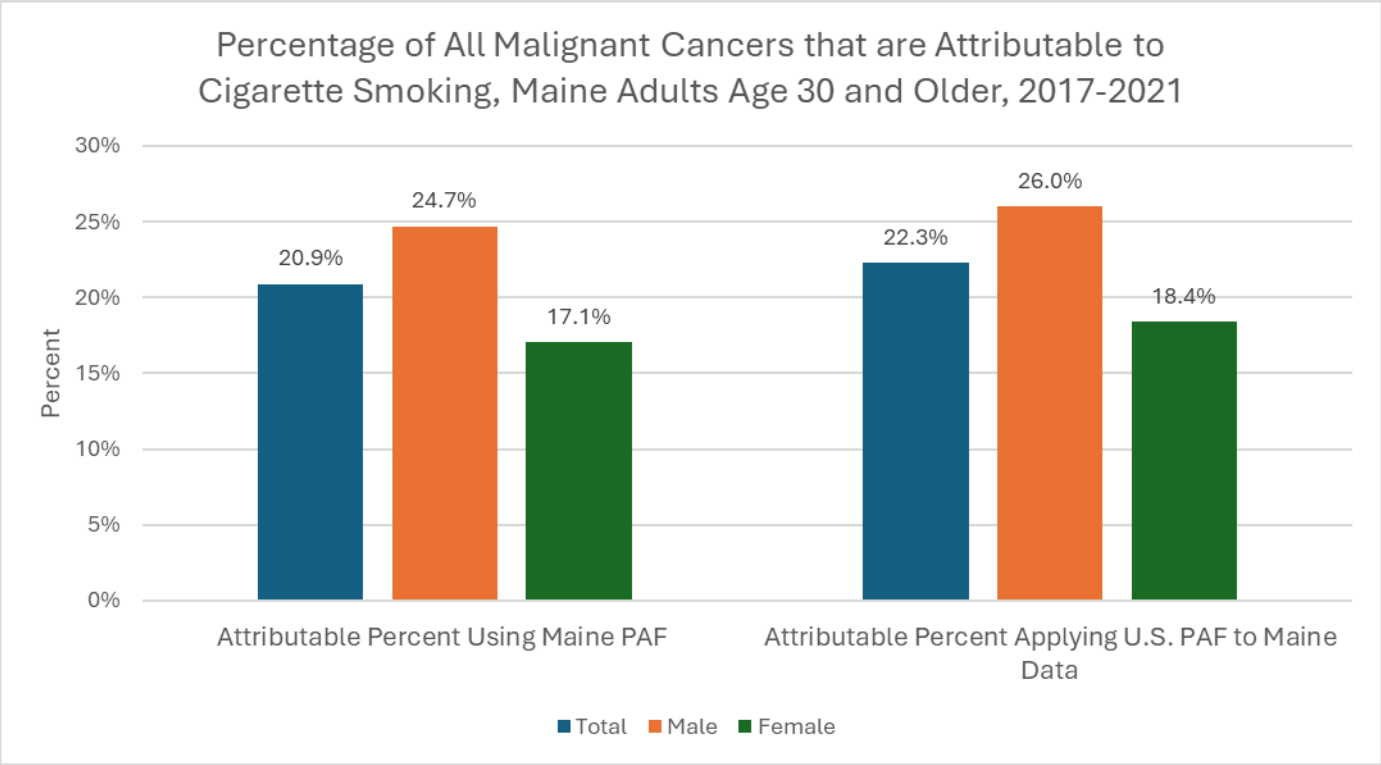
Conclusions:

- One in four new cancers diagnosed among Maine males aged 30 years and older and one in six cancers diagnosed among Maine females aged 30 years and older are attributable to cigarette smoking.
- Overall, Maine-specific PAFs resulted in 6.3% fewer attributable cases than applying national PAFs. The overall percent of cigarette smoking cancers of all malignant cases among Maine adults was 20.9% using Maine-specific PAFs versus 22.3% using national PAFs.
- Using national PAFs leads to some overestimation for Maine due to differences in the underlying cigarette smoking prevalence between Maine and the U.S. The differences in estimates vary based on cancer site and sex.

Figure 2:



Conclusions (continued):

- This analysis provides a more precise estimate of the percentage of new cancer cases that may be caused by certain exposures rather than simply summing all cases from sites associated with cancer risk factors (as is done with risk factor-associated cancer rates).
- While 44.5% of all new cancer cases occur in sites **associated** with cigarette smoking, using PAFs allows us to more precisely state that an estimated 20.9% of all new cancer cases are **attributable** to cigarette smoking.

Table 6: Summary of Comparison of Results Using Maine Specific PAF vs. Using National PAF for Cigarette Smoking-Attributable Cancers

	Total 5 Year Associated Case Count (2017-2021)	Attributable Count: Using Maine PAF	Attributable Count: Applying U.S. PAF to Maine Data	Difference in Attributable Count: Applying U.S. PAF vs. Maine PAF
Total				
All Malignant Cancer Sites	46,916	--	--	--
Total Cigarette Smoking Cancers	21,253	9,812.30	10,471.70	659.4
Percentage of All Malignant Cancers	44.5%	20.9%	22.3%	--
Males				
All Malignant Cancer Sites	24,137	--	--	--
Total Cigarette Smoking Cancers	12,342	5,962.10	6,281.90	319.8
Percentage of All Malignant Cancers	51.1%	24.7%	26.0%	--
Females				
All Malignant Cancer Sites	22,779	--	--	--
Total Cigarette Smoking Cancers	8,911	3,889.20	4,188.50	299.2
Percentage of All Malignant Cancers	39.1%	17.1%	18.4%	--

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Summary:

- This analysis explored the feasibility and utility of creating Maine-specific PAFs instead of using nationally calculated PAFs to understand the impact of cigarette smoking on cancer incidence rates in Maine.
- Our findings suggest that estimates based on Maine smoking history were relatively close to estimates using national data, although using national PAFs for cigarette smoking led to some overestimation due to differences in the underlying risk factor prevalence between Maine and the U.S. The differences in estimates vary based on cancer site and sex.
- Based on these explorations, while Maine-specific PAFs based on the smoking history of Maine adults would provide more accurate estimates of cigarette smoking-attributable in Maine, the time and resources to conduct this analysis is significant.
- Applying nationally published PAFs to Maine cancer counts to estimate cigarette smoking-attributable cases is a reasonable approach, providing more precise estimates of the impact of risk factor exposure on cancer incidence than simply summing all cases from sites associated with cancer risk factors (as is done with risk factor-associated cancer rates) while also being more a more feasible method for the MCR to use on a regular basis.

Clarification of "Tobacco-associated" cancer, "Tobacco-related" cancer, and "Cigarette smoking-attributable" cancer

Groupings of cancers associated with tobacco use, obesity, and human papillomavirus (HPV) exposure have been included in MCR publications due to their clinical, epidemiologic, and cancer prevention significance. Our approach and definitions have evolved over time. Several years ago, we adopted predefined SEER*Stat variables for calculating the number and rates of associated cancers for selected risk factors. These precise definitions allowed us to produce local incidence estimates using nationally accepted and published methods.

For more than a decade, the Maine Cancer Registry has used the term "tobacco-related cancer, excluding lung and bronchus" to quantify the additional impact of tobacco use on cancer incidence and mortality. The current definition includes the following cancers: oral cavity and pharynx, esophagus, stomach, colon and rectum, liver, pancreas, larynx, cervix, urinary bladder, kidney and renal pelvis, acute myeloid leukemia. Lung, bronchus and trachea cancer are not included in this measure; lung and bronchus cancers have been presented separately. We have defined this term to produce both incidence and mortality counts and rates, although it has changed over time to include additional cancer sites as more research has become available. This measure is available annually in Maine's Community Health Needs assessment dashboard and reports.

The term "tobacco-associated cancer" is defined by SEER and is a broader measure than "tobacco-related." It includes trachea, lung and bronchus cancer as well as other tobacco-related cancers which may be related to tobacco use more broadly, not just cigarette smoking.

In this report we have explored cigarette smoking-associated and attributable cancers, which is limited to cancers associated with cigarette smoking, in contrast to cancers associated with any tobacco exposure.

Estimates for risk factor-associated cancers are based on cancer type only, whereas risk factor-attributable cancers take into account risk factor prevalence and the relative risk specific for a cancer type.

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